

ECOLOGICAL ORGANIC AGRICULTURE INITIATIVE

Success Stories in Kenya



Networking for a greener Africa.



<https://www.pelumkenya.net/>

2024



The role of organic agriculture, whether in farming, processing, distribution, or consumption, is to sustain and enhance the health of ecosystems and organisms from the smallest in the soil to human beings.

INTRODUCTION

Ecological Organic Agriculture Initiative (EOAI)

The Ecological Organic Agriculture Initiative is an African-led initiative aimed at promoting organic farming in Africa. This was in response to the African Heads of State Decision EX.CL/Dec.621 (XVII) on organic farming made at the conference of Ministers of Agriculture held in Lilongwe, Malawi in 2011. The overall goal of Ecological Organic Agriculture Initiative (EOAI) is to mainstream EOA into the National Agricultural systems, policies, and programs by the year 2025 to improve agricultural productivity, food security and access to markets and sustainable development in Africa. The initiative has been implemented in nine countries namely: Ethiopia, Kenya, Uganda, Rwanda and Tanzania in Eastern Africa and Benin, Mali, Nigeria, and Senegal in West Africa. The initiative works through six interrelated pillars implemented by various partners within the implementing countries.

EOAI Vision

Vibrant Ecological Organic Systems for Enhanced Food Security and Sustainable Development in Africa

EOAI Mission:

To scale up ecologically sound strategies and practices among diversified stakeholders through institutional capacity development, scientific innovations, market participation, public policies and programs, outreach and communication, efficient, coordination, networking and partnerships.

The Overall Goal of the EOA Initiative

To mainstream Ecological Organic Agriculture into national agricultural systems by 2025 in order to improve the quality of life for all African citizens.

EOAI Objectives

- To increase documentation of information and knowledge on organic agricultural products along the complete value chain and support relevant actors to translate it into practices and wide application.
- To systematically inform producers about the EOA approaches and good practices and motivate their uptake through strengthening access to advisory and support services
- To substantially increase the share of quality organic products at the local, national and regional markets.

- Strengthen inclusive stakeholder engagement in organic commodities value chain development by establishing national, regional and continental multistakeholder platforms to advocate for changes in public policy, plans, programs, and practices.

EOAI Implementing/ Pillars

1. Research, Training and Extension Pillar: Understanding research and training gaps within EOA value chains and undertaking activities to fill them.
2. Information and Communication Pillar: Creating awareness and strengthening EOA extension support systems through diverse information and communication strategies, products and technologies.
3. Value Chain and Market Development Pillar: Stimulating development of sustainable markets and increase trade in traditional and high value agricultural produce both at domestic and export levels within EOA.
4. Networking and Partnerships Pillar: Promoting engagement by relevant stakeholders including governments, farmers, civil society, private sector and the international community.
5. Policy and Programme Development Pillar: Supporting the development and implementation of enabling policies and programmes.
6. Institutional Capacity Development Pillar: Supporting and equipping professionals with skills and competencies to promote EOA in Africa.

ABBREVIATIONS

AOA	Agroecological Organic Agriculture
EOA	Ecological Organic Agriculture
EOAI	Ecological Organic Agriculture Initiative
FAO	Food and Agriculture Organization
FLIPs	Farm Farmers Learning and Information Points
KEBS	Kenya Bureau of Standards
KOAN	Kenya Organic Agriculture Network
KTN	Kenya Television Network
PELUM	Participatory Ecological Land Use Management
PGS	Participatory Guarantee Systems
PSPs	Practicing Skills Providers
SACDEP	Sustainable Agriculture Community Development Program
ToTs	Trainer of Trainers
UON	University of Nairobi
YMFCs	Yatta Multipurpose Farmers' Cooperative Society

SUCCESS STORIES

1. Transitioning farmers towards 'organic future' for improved livelihoods
2. 'HEAL – THY': A family's journey towards promoting Ecological Agriculture
3. Threefold Sesame yields after organic compost research for Busia oil crop Cooperative farmers
4. Farmers' farmer: Farmer facilitators bridging the ecological organic agriculture extension services gap
5. Multiple uses of Azolla saves organic farmers from animal feed costs
6. Enhanced efficiency, product quality and market reach expansion for Mongo value chain

Transitioning farmers towards 'organic future' for improved livelihoods



In 2019 Shadrack Mbolonzi, a passionate organic farmer realized that he couldn't access fresh, organic produce in his County's neighborhoods so he decided to join by then the Machakos Organic Farmers group to spearhead the creation of a community organic co-operative. "My goal was simple, to provide locally grown organic food, market the organically produced products and to educate residents about sustainable practices." This is how his personal experience into organic farming, leadership and community engagement begun.

Mbolonzi started by coordinating the presentation of the idea to the local community, securing facilities to house the cooperative and to register with the Co-operatives department. To recruit members, he had to employ outreach, engagement and problem solving strategies attracting 8 initial clusters each with at least 12 individuals. "I focused on motivations like environmental concerns, skill-building and fostering

personal investment. We addressed the initial low turnout by organizing capacity building workshops facilitated by KOAN, offering facilitations as incentives, which boosted interest to several participants."

About the cooperative

Yatta Multipurpose Farmers' Co-operative Society (YMFCs) is a dynamic farmers' co-operative in transition toward organic and agro ecological agriculture, specializing in the mango value chain. By integrating sustainable practices and market-driven processing, the co-operative has achieved remarkable financial success and improved livelihoods for its members.

The membership structure includes a total of 887 registered farmers (596 men, 291 women, including 12 youth). Shareholders include 413 actively invested members. The cooperative is keen on gender inclusivity and youth engagement, with 33% female

participation and dedicated support for young farmers. The cooperative has benefitted immensely and are currently at 70% status to achieve organic status on all their practices and products. The process includes a shift from conventional farming of all the members to certified organic practices which is in progress focusing on agroecological methods to enhance soil health and biodiversity. Their flagship value chain includes processing organic certified mangoes into puree and juice. They add value through local processing, reducing post-harvest losses and boosting income. Other ecological practices implemented includes climate-resilient techniques such as composting, intercropping, and natural pest management.

To equip members with organic farming skills, the structured workshops facilitated by KOAN and peer organizations focused on composting, crop rotation, and natural pest control using locally available organic materials. Hands on mentorship involved paired novices with experienced gardeners for guided practice in soil preparation, planting, control of weeds, pruning, spraying, harvesting, sorting, transportation, packing and storage. “We created a digital worksheet with planting schedules and organic certification guidelines, accessible via the social media group.”

The leadership involved delegation of assigned roles, tech-savvy members managed creation of planting schedules, managed mediation of disputes over sales allocation by implementing a rotating selection roster ensuring fair access and organized harvest staggering to ensure no wastage occurred as result of congesting the collection centers with more than what is ordered by the market.

Achievements

The transition process is long but farmers can see value in return at the end of the tunnel. “We are dealing with farmers who are fairly aged and sometimes unable to comprehend the information and the technology being applied during trainings due to literacy levels and lack of financial muscle to facilitate attainment of the required organic standards. However, this setback hasn’t dampened their enthusiasm for a better future,” the chairman added. “We encouraged participation consistency by introducing flexible volunteering hours

and a “Adopt-a-Bed” program for busy members. To manage knowledge gaps, we regularly added beginner-friendly workshops and worked to simplify complicated concepts.”

In the first year yield the cooperative produced 200+ kilos of vegetables, supplying 15% of the food stores’ seasonal needs. The membership steadily grew to over 300 active members. “My legacy and reflection is the inspiration of some of the members to start making organic foliar feed sprays from the local material, amplifying the project’s educational reach,” Mr. Mbalizi said. This experience honed his ability to lead through empathy and adaptability, transforming a small idea into a resilient community organic asset.

YMFCs exemplifies how co-operatives can drive rural transformation through ecological innovation, strategic partnerships, and value-added processing. With a clear market edge and committed membership, the co-operative is poised to become a regional leader in organic agriculture influencing neighboring organized farmer entities to adopt similar practices for an EOA future.

Currently, Mr. Shadrack Mbolonzi, a retired Brigadier in the Kenyan army, is Chairman of the National PGS committee, a member of the forthcoming Eastern Africa Agroecological Transformation Conference Organizing Committee representing the Kenyan Organic farmer. This underscores the power of inclusive training and strategic recruitment in fostering sustainable change. “Our utmost and absolute focus is to convert the YMFCs’ 887 registered farmers into full status organic farmers. We are in the process of registering our mango pulp/juice as an organic product with Kenya Beureau of Standards (KEBS)”. We have and seriously working towards achieving this by eliminating substances not allowed either in USDA or EU standards.

‘HEAL – THY’: A family’s journey towards promoting Ecological Agriculture



The Principles of Health, Ecology, Fairness, and care are the roots from which organic agriculture grows and develops. They express the contribution that organic agriculture can make to the world, and a vision to improve all agriculture in a global context. The role of organic agriculture, whether in farming, processing, distribution, or consumption, is to sustain and enhance the health of ecosystems and organisms from the smallest in the soil to human beings.

In support of this organic principle, Donbosco Kiriimi's story of a renewed healthy living is entirely circumstantial after discovering the power of investing in ecological therapy (the use of nature or natural elements to improve mental and /or physical health). The health benefits of organic agriculture have been his driving force through Ecological Agriculture trainings and practical applications evident in the family's "BiG Organics and Naturals" farm that sits on a 5-acres land

in kyeleni ward, Matungulu-sub county, Machakos County.

"My journey into organic farming was motivated by my mother, Charity Nkatha – a retired nurse who has been battling life threatening lifestyle diseases including hypertension and thyroids. We tried different solutions focusing in healthy foods unsuccessfully after several medical interventions and prescriptions. I invested my time doing more farmer led research where I understood that she needed specifically organic foods that had more holistic nutrients."

"This pushed us to start growing our own foods with the motivation of Healing ourselves "HEAL-THY" - most people say they are healthy but not true this gave us deeper understanding of the word while looking at look at different ecological dimensions. Family members were uncomfortable with this organic system and

pushing to shut down while claiming unsustainability. However, in the long run, the organic foods approach was the best source of therapy for her. In EOA we appreciate organic inputs for soil health, seeds, the bio inputs that control any pests, fungal, bacterial or viral issues - there was a lot of change once mum continued to visit the farm for daily foods and orientating herself on the nutrients needs. In the farm most of the foods grown are untapped resource assumed by many as wild weeds while in the real sense are unknown to them e.g. Dandelion, Milk thistle, vegetables that can be cooked like (black jack, McDonald's eye, Purslane - a good salad when still raw)"

"BiG Organics and Naturals" Farm

The biggest motivation behind this farm is based on practical application of Organic Farming Knowledge Donbosco acquired from SACDEP Kenya and KOAN, EOA-I pillars implementing partners for in Kenya. He was exposed in farmer-led research and advocacy on EOA as the sustainable solution to the climatic and food-related problems faced by farmer communities and ecosystems.

"The big difference is the organic farming knowledge I have acquired over time and the consistency in practicing EOA since 2017. Within my neighborhood you note excess deforestation, tillage of land especially towards the rainy season where there is a lot of surface run-off. During planting seasons small holder farmers are not prepared to have own raw materials/ inputs especially clean seeds and are forced to buy inorganic inputs from agro vets instead of preserving indigenous seeds. Inorganic/synthetic fertilizers usage attracts pests hence increased cost of production."

Part of the EOA lessons applied include producing Bokashe - Japanese for fermentation of different diverse organic matters that feeds soil but and the plant. Donbosco can now produce the organic inputs that is both soil amendments and organic fertilizers in addition to rearing good animals after learning standard operating procedures of mixing good feeds. "My wife also attended the Nairobi Bee institute for bee farming training hence culminating the entry of an apiary in our farm where we target to have more than 2,000 hives. Currently we are in the hundreds."

The farm cultivates a wide variety of crops including; Medicinal plants and herbs - sage, lemon grass, dandelion, chamomile, rosemary, neem, gooseberries leave, artemisia, mints, phyla, carissa, rose geranium, thyme, aloe, sandal wood, mulberry, moringa, Tephrosia, ajuga remota, African spinach, purslane. Fruits - gooseberries, apples, pomegranates, lime, oranges, mulberry. Indigenous vegetables - amaranth, Saget, mito, sweet potatoes, night shade, mrenda, pumpkins, chayote, jute mallow, cowpeas, black jack, Macdonald eye, pigeon peas, moringa, jack bean, potatoes, azolla, Malabar spinach. Pulses- beans (jack, yellow), Dolichos lab, cowpeas, pigeon peas, sorghum, millets, finger millets, groundnuts and conservation of indigenous species - sandal wood, croton, combretum molle, acacias, leucaena, sesban sesbania.

The farmer is fermenting herbs to produce tinctures for human use and fermentation of different organic bi-products to re-use and add value to the bi products. The farm uses techniques for mass regeneration such as Permaculture whose ethics and principles mimic nature to create resilience in the ecosystem. Other techniques include syntropic agroforestry used to smartly reclaim bare land.

"A Circular Economy" Mindset Farm

This is more than just a farm, it is a holistic, regenerative, climate smart approach that seeks harmony, sustainability and longevity hence bolsters resilience and restores balance in the whole ecosystem. The farm is fully geared by the circular economy mindset that helps maximize on already available untapped resources.

Its dubbed BiG Organics due to the farming approaches used including Soil health and fertility management through continuous preparation and use of diverse organic inputs such as compost, Bokashi, biochar, green manure and bio slurry to enhance soil fertility. Agroecological practices like cover cropping, intercropping mulching, companion planting to promotes natural pest control, crop rotation, minimum tillage and agroforestry to prevent soil erosion; improve soil structure (aeration) and enhance biodiversity (microbial activities). The farm has invested in organic waste management and recycling (circular economy)

– adoption of waste-to-resource strategies and techniques such as Biochar and briquettes making, composting, bio slurry production and utilization. They also intervene through feeding fish with rabbit droppings, the nutrient-rich fish water is then used to grow Azolla and consequently, to irrigate the farm. Pollinators also feed on the water.

The farmer also practices seed sovereignty and biodiversity conservation. The farm is passionate about seed bulking and aggregation of indigenous nutrient-rich resources that are in danger of extinction. The farm cultivates a wide variety of crops including medicinal plants, herbs fruits and indigenous vegetables to not only enhance food security but also food sovereignty. This not only gives us power to choose what to plant but also when to plant and utilize it. The farm prides itself as an indigenous farm run by indigenous farmers enlightened and aware of the current and growing innovations, yet passionate to conserve all ecosystem.

Mentoring farmers and trading organic products

As a practicing a Practicing Skills Provider (PSP) level one, Donbosco has been able to train over 400 farmers on the site and more than 1000 off site. His mother and wife are amongst others community members make up PSP level two. These farmers learn soil fertility especially composting, understand the different responsible farming techniques (EOA) through observation and touching.

Donbosco underwent Participatory Guarantee

Systems (PGS) certification course through KOAN. He termed this as a great reassurance of the organic trajectory due to its system that covers a group of organic farmers. This enables me to trade my organic products including; Vegetables, Fruits, Herbs, Value added products -Dandelion, Milk thistle, Pepper, Lemon grass and Azolla. I'm yet to sell bio fertilizers awaiting certification for the Kilimo Hai Organic certification mark. With PGS certification each farmers batch is uniquely recorded for traceability purposes. There are several peer reviews to make sure farmers maintain the EOA principles and practices for safe and clean products.



Threefold Sesame yields after organic compost research for Busia oil crop Cooperative farmers



In 2023 PELUM Kenya concluded a EOAI baseline survey with recommendations to increase the knowledge base of EOA technologies and practices and enhance its adoption. This was through creating stronger collaboration of the EOAI with Institutions of higher learning like Egerton University to enhance EOA research, training, and extension and also increase the number of farmer groups working with the research, training and extension pillar.

The EOA project sought to focus on mainstreaming ecological organic agriculture practices while stimulating market access for smallholder farmers. Busia Oil Crops Cooperative with over 800 farmers in 2015, was selected as a main value chain actor from a stakeholder mapping exercise. The Kenya Organic Agriculture Network (KOAN), the value chain management pillar implementing partner, conducted a stakeholder and root cause analysis to understand why, despite the efforts of the Cooperative, they

still suffered from market access challenges. A key challenge identified was that farmers were getting meagre yields for Sesame, Chia and felt the crop was not providing any profit and hence did not put much effort into them. Through funding under the EOAI's Research, Training and Extension Pillar 1, KOAN linked the Cooperative to Egerton University which worked on the farmer's productivity challenges. The research team strategically situated their trial, demo and training plots in the main cooperative zones of Lukolis, Amungura, and Kidera for ease of access by members.

Objective of the research

The research aimed at determining the effects of organic compost on yields of sesame in an effort to increase Sesame production. The cooperative farmers were practicing organic sesame production by default without the use of any soil amendment. This was due to limited knowledge on the use of organic fertilizer and on how to make them. The other challenge

identified was that farmers were harvesting on average low yield in sesame production of 250kg/Ha compared to potential average yields of between 500 to 1,000kg an acre. The baseline study showed that farmers lost up to 25% of their sesame seeds due to postharvest handling process, especially during the drying.

About Sesame

Sesame seed is one of the oldest oilseed crops known, domesticated well over 3,000 years ago. The oil is a clear edible oil with a pleasant taste and a very good long shelf life if properly refined. Sesame has an oil content of 48-55% which is the highest of any oil crop while the protein content ranges from 44 to 48%. Despite its importance, sesame yield potential in Kenya is very low with scanty information is available on sesame diversity, agronomy and the influence of biotic and abiotic factors on sesame productivity and nutritional value in Western Kenya

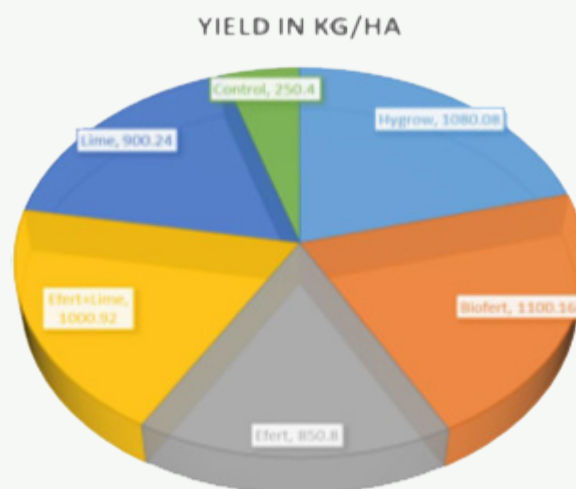
Benefits of Sesame

Sesame is an important crop for edible oil, food and animal feed. Sesame seeds are an important source of oil (44 - 58%), protein 19-30% (Ssekabembe 2007) and carbohydrates 13.5% (Yoshida 1994). The seeds also have multiple uses in food industry as ingredients, decorative elements and highly nutritious constituents of confections in bread, cakes, pastry and as halva (Elleuch, Bedigian, and Zitoun 2011). Sesame is also an important element in crop rotation and intercropping for improved soils fertility. It is also an excellent soil builder - as it improves the soil texture and moisture retention and lessens soil erosion. Sesame is resistant to drought, tolerant to insect pests and diseases, a low-cost crop and therefore one of the best alternative specialty crops.

Homemade bio-compost

40 farmers were selected and trained on organic compost making drawn from Among'ura and Lukolis farmers clusters respectively. After the research intervention the yield increased three fold as revealed in the chart.

The control farm with a harvest of 250kg/Ha maintained the old practice where farmers used to plant without any soil amendment and planted naturally without any fertilizers. Lime was used to test the soil performance. Hygrow and Biofueza are commercially available bio fertilizers with a harvest of 1080kg/ha and 1100kg/Ha respectively. Efert (Egerton Fertilizer) was the homemade fertilizer with two trials recording 1000.92kg/Ha se the highest when mixed with Lime. Efert included farmyard manure, Tithonia diversifolia, quarry dust, charcoal dust and soil conditioners with beneficial microbes. The research team trained smallholder sesame farmers on how to make organic fertilizer.



Postharvest Losses Handling

The farmers were drying their sesame in tied bundles outside without shelter. This method leads to loss in quantity and quality of sesame mainly due to damage and kernels as a result of capsules bursting. As a result, locally fabricated solar dryer as shown in the picture below was taught to farmers as a way of mitigating the losses. After that the intervention helped the farmers save the 25% sesame lost during the postharvest time and reduced the drying time from two weeks to 4 days.

Dissemination

The research was participatory with 40 farmers involved during the farming season in 2020 when the trials were done. The farmers observed the

trials in all stages and learnt performance of the trials in conjunction with the researchers. This was the first step of direct dissemination of both the research knowledge and also practical application. Egerton University disseminated the results of the new research with Smart Harvest magazine run by Standard Newspaper, FarmKenya (KTN farmers) who are part of the partners implementing EOAI Pillar2 that's creating awareness and strengthening EOA extension support systems through diverse information and communication strategies, products and technologies. The research is also available the EOAI online portal.



Traditional drying of Sesame



Solar Dryer by Egerton University



“Farmers’ farmer”: Farmer facilitators bridging the ecological organic agriculture extension services gap



In Kenya farmers have limited access to extension services with an estimated ratio at 1:1000 according to NASEP (2012), far below the FAO recommended ratio of 1:400. These services tend to be top-down limiting farmer input and reducing engagement and therefore unable to cope with the demand dynamics of modern agriculture. Through Agriculture Sector Transformation and Growth Strategy, the country plans to attain a ratio of 1: 600 by 2029.

Without organized EOA extension service network, transfer of sustainable farming practices will be minimal hence affecting adoption. EOA practice is still new to many farmers hence the need for regular training and extension service support. Through the support of SACDEP Kenya the Research, Training and Extension pillar implementing partner, the EOA-I program employs the farmer-led extension approach using the Practicing Skills Providers (PSPs). The PSPs are farmers who already practicing a particular skill on their farms to some degree of success. These farmers are a source of information to the neighboring farmers.

The PSPs Level 1 are trained further in theory and practice to improve the enterprises in their farms. Their farms then become demonstration and training units which are known as On-Farm Farmers Learning and Information Points (On-farm FLIPs). Each PSP Level 1 reaches out to 15 neighboring farmers forming a learning cluster of 16 farmers. The 15 farmers are referred to as PSPs level II. To help in the dissemination of agriculture technologies learnt, field days are hosted at the On-Farm FLIPs to reach out and train the general public.

“The farmers’ farmer”

Euticus Murege Kamau is referred by his neighbours as farmers’ farmer – a zealous farmer always ready to share his rich knowledge about organic farming. Euticus who lives in Kianjohi village of Maragwa Constituency is among 161 Level One PSPs in mobilized by SACDEP in Machakos and Murang’a counties. There are very few professional experienced personnel who can train on EOA compared to the demand by the farmers in this region. Euticus is filling the extension gap by sharing knowledge and educating peer farmers and

visiting farmers on various EOA practices. Hi farm is a dedicated On-farm FLIPs training unit.

Euticus reminisces when he first settled in Kianjohi village, there was no diverse organized farming other than the commercial coffee farming. He introduced bananas and English potatoes. “My hard work was recognized by government extension officers then who introduced me to SACDEP. Unlike today, there were minimal risks on soil damage from industrial fertilizers hence low interest in organic farming unless trained by agricultural extension workers.” His farm is covered with diverse crops including indigenous vegetables, tree tomatoes, dragon fruits, strawberry, plantain banana varieties, herbs, spices and assorted fruits. SACDEP has provided him with assorted seeds and goats for rearing. In addition, Euticus also rears rabbits as an enterprise and other complimentary uses including farm manure from rabbit urine.

“Our local farmers just need to observe and touch! This psychologically makes them feel they are capable to replicate what they have learnt. This year alone I have interacted with more than 300 farmers in my half-hectare farm. They feel convinced because we are in the same climate, farm layout size and similar livelihood challenges.” Visiting farmers learn a wide range of EOA practices on small-space farming techniques including; vertical gardening like promoting sack gardens and container-based vegetable farming. Intercropping and companion planting maximizing production by growing multiple crops in the same space. Permaculture and agroecology where farmers learn to design productive small-scale organic farms and sustainable water harvesting, usage and irrigation techniques to maintain high production on limited land. Participatory Extension Approach is effective in encouraging farmers to lead their own learning processes through group-based experiments.

“The visiting farmers have interest in different crops and farming techniques with interest on herbs and spices, indigenous vegetables, the production of hibiscus which is on high demand, fish farming and inquiry on nutrition benefits of various foods.” Euticus values training and doing practical demonstrations as he works with organized community groups, public forums like barazas and impromptu visitors as a way of improving EOA farmers network in Maragwa sub-county and beyond. “You must be passion driven to

understand other farmer’s needs. Sometimes I wake up late at night to affirm a concept in the farm in order to clarify something to a farmer. When I learn something new I write down or take photos for sharing.”

The PSP and On-farm FLIPs extension approach is enabling farmers to learn from each other, advice each other, and develop their communities through farmer field days with a success of reaching hundreds of farmers with EOA knowledge. Most of the converted farmers are practicing organic farming integrated it with traditional farming practices. The PSP have invested time and resources to help other farmers replicate various agro ecological models for both crop and animal husbandry to enhance productivity.

According to Euticus, the entry point is to first provide enough information on organic fertilizer and composting i.e. Bokashi. He focuses on comparison i.e. minerals in the fertilizer needed and priority crops. He then shares information on soil treatment and farm irrigation and water recycling management. “My farm isn’t just an on-farm FLIPs centre but a meeting point for farmers, a change facility. Being a PSP requires a dedicated farmer with deep interest in organic and hands on farming. Be ready to do follow ups with farmers and have consistency in all you do.” Though the FLIPs centres farmers learn to increase productivity using EOA practices as opposed to farming in large areas that may cost a farmer due to high inputs and cost of labour.

The PSPs gain from hands-on training in ecological organic agriculture (EOA) practices. They learn natural soil fertility, pest/disease management, good agronomic practices, crop irrigation, plant spacing and seed multiplication and climate resilience. The PSP model is a practical way of equipping these farmers how to strengthening farmer networks through Farmer Facilitators and participatory extension approaches through exposure learning visits, setting up farmer-led research trials and demonstration farms and promoting intensive farming on small spaces through innovative organic techniques. The established FLIP centers like Euticus’ farm provide access to training materials and demonstrations.

Multiple uses of Azolla saves organic farmers from animal feed costs



Joseph Ngure is a smallholder organic farmer residing in Molem village, Maragwa sub county in Muranga County. Prior to joining EOAI project, Joseph dreamt of increasing his family income through dairy production but was limited due to the cost of animal feeds. His two dairy cows costed him 8kgs of dairy feeds costing KES 50 per kilo.

During a farmer field day hosted by SACDEP in his farm, Joseph learnt about Azolla as high-quality livestock feed rich in proteins, amino acids, vitamins and minerals. His recollection of the initial knowledge about Azolla was a bit scanty and so SACDEP organized an off-station community-based training sessions that enabled Joseph to learn from experienced farmers the practical steps of planting and managing Azolla.

Azolla is a free-floating aquatic fern that is native to tropical and subtropical regions. It is a fast-growing plant that can be used as a livestock feed, bio-fertilizer, and mosquito control agent. It is a highly productive plant that doubles its biomass in a small growing area within 3-10 days, depending on the growing conditions. Azolla farming is a low-cost and sustainable way to produce these valuable products. Azolla is a low-maintenance plant, but it does require regular harvesting and care.

Joseph's initial impression was how green and attractive Azolla is. "I learnt the different species of Azolla and how to plant in a pond set up. It

requires fully composted manure for nutrients and about two feet of root space and requires water with a high phosphorus content.” With this new knowledge, Joseph was set to replicate Azolla farming in his farm.

How to plant Azolla

The most common variety of Azolla grown in Kenya is Azolla pinnata. This variety is tolerant of a wide range of environmental conditions and can be grown in both ponds and tanks. The following general steps Joseph used in his first attempt;

- Joseph first dug a small pond of 2 by 2 meters’ wide and 20 cm deep closer to his tree canopy. He began with a smaller pond for testing and due to the small farmland.
- After digging out and levelling the soil, he then spread a dam liner to prevent water loss
- He raised embankments of the pond side walls with the excavated soil. He ensured all the sides were properly secured to avoid erosion.
- He filled the pond with water leaving an eight centimeter height to allow the Azolla roots float.
- He then uses phosphorus rich farm manure – e.g. cow dung slurry with wood ash packed in a shade net then inoculated into the pond. He left the ingredients to settle
- He then placed the Azolla ferns to the pond. The harvesting happened after 2 weeks.
- He thoroughly washed the harvested Azolla to be to remove dirt and the smell of cow dung before feeding them to two dairy cows.

Care and maintenance

- Azolla requires regular harvesting and care - every 3 days to prevent overcrowding. The harvested Azolla can be fed directly to animals or dried for later use.
- Add organic phosphate supplements and cow dung slurry at least every 5 days. This helps to maintain the mineral and nutrient levels in the water

- Replace 30% of the old water with fresh water every 10 days. This prevents nitrogen buildup and helps to keep the water clean.
- Completely replace the water and soil every six months and adding fresh Azolla seeds. This will help to prevent the Azolla crop from becoming infected with diseases.

Benefits

Currently Joseph has 2 Azolla farming ponds constructed on his farm. Since he begun farming he has saved over 50% from buying dairy feeds for his two dairy cows. He is also supplementing the feeds with his goats, pigs and also chicken and ghoose as poultry feed. “I harvest 1 Kg daily mainly for dairy cows’ feed. Since the ponds are small I’m able to feed the cows and occasionally other animals and poultry. This has saved me KES 200 daily from buying dairy feeds.”

He reuses the water from pond to boost his biofertilizer. “Every time I empty the pond, I sprinkle the waste water as biofertilizer top dressing in my farm where I have planted arrowroots and vegetable.” Joseph is currently completing his third biggest Azolla pond 8 by 10 meters wide. “I plan to add 3 dairy cows and more pigs. This expansion will supplement my income by selling more Azolla to other farmers at a cost of KES 1,000 (USD 7.72) per kilo.” This will become critical for his family’s economic well-being.

Joseph’s success has attracted the attention of other farmers in his neighborhood, making him a key Practicing Skills Providers (PSP). He has trained more than 20 farmers and he now plays an important role in the expansion of Azolla farming in his village and beyond Muranga County.

Other benefits for organic farmers

Azolla is an efficient feed substitute for livestock because it's highly digestible and has a low lignin content. It also fixes nitrogen from the atmosphere and provides organic fertilizer for crops and can be used as a soil amendment to increase crop yields. Azolla absorbs and degrades environmental pollutants as bioremediation from water and detoxify hazardous chemicals. It can also be used to control weeds in paddy farms. It can be used as an organic mulch to slow water evaporation and maintain soil moisture.

Note: Azolla is considered an invasive plant species in wetlands and freshwater lakes as it can substantially alter aquatic ecosystems and biodiversity. Therefore, it is advisable to cultivate it in a controlled environment, such as an artificial pond away from naturally occurring water bodies.



Enhanced efficiency, product quality and market reach expansion for Mango value chain



Kenya Organic Agriculture Network (KOAN) has been spearheading the implementation of activities under the Value Chain Market Development Pillar in Kenya with the goal of building functional value chains and vibrant markets that drives sector's growth. To further increase trade in EOA high value products at the local market KOAN came up with strategies to be applied during the second phase of the project including Capacity building of various value chain actors through farmers training, facilitating more trader-producer meetings and interactions for the purposes of striking business deals.

Household survey conducted in 2023 by PELUM Kenya indicated that majority of the farmers in Kenya do not engage in any value addition prior to marketing their farm produce. Most of the farmers market their organic produce individually, through group/collective marketing and locally to traders and

consumers was common. According to KOAN's 2022 market survey report, fresh fruits and vegetables are mostly sold in the domestic markets followed by value added products. KOAN partnered with Mango farmers in Machakos County to promote organic farming, improve their product efficiency and increase market access.

Preparation for organic certification

KOAN trained Yatta Multipurpose Farmers' Cooperative Society (YMFCs) farmers in Machakos County on Participatory Guarantee Systems (PGS) development certification. In order to penetrate the organic market, the cooperative farmers were trained on the importance of transitioning to organic farming and tracing systems. The cooperative partnered with KOAN to adopt Agroecological Organic Agriculture (AOA) status. This is a holistic approach balancing ecological health and productivity.

The cooperative plans to expand organic certification with a new sustainability goal of strengthening agroecological practices to build climate resilience and meet growing demand for organic products. Part of the cooperative farmers were also trained on sustainability & Environmental Impact – Promoting eco-friendly and sustainable farming practices. 40 Organic farmers are to be certified awaiting assessment results. These will in turn be trained to be Trainer of Trainers (ToTs). Due to his dedication, the cooperative chairman is the current national PGS committee chairman. This prepositions the cooperative to more organic networks hence increasing competitiveness and brand improvement.

Value addition training

The YMFCS staff were trained at the University of Nairobi (UON) on Mango value addition. The aim was to enhance product quality and innovation by strengthening the cooperative's ability to develop high-quality value-added products, efficient production and waste reduction by optimizing resource utilization and minimizing losses. The training helped them learn more on how to make pulp and juices and how to preserve it for prolonged shelf life using organically approved preservatives. Through food safety and quality control, the team learnt how to adhere to strict food safety regulations to maintain hygienic to reduce contamination of the final products. The team also gained knowledge on workforce skill development to equip members with the knowledge and technical skills needed for long-term success.

Servicing production machinery

Most of the value addition machinery existing in YMFCS had suffered breakdown hence inefficiency to enhance production of the various products. Through EOAI, KOAN provided a grant to support in repairing the Fruit Pulper machine. "They successfully restored and upgraded our pulper machine leading to significant operational improvements. This included installation of an outlet for puree hence streamlining extraction for improved efficiency. They also helped in the insertion of a new sieve with enhanced modification for easy removal for facilitating maintenance and hygiene," the cooperative chairman

confirmed. Installation of new food-grade brushes ensured compliance with safety standards and improving processing quality. "These enhancements have improved our production capacity, reduced downtime, and increased the quality of our processed products," he added.

Market expansion and access

KOAN connected YMFCS to premium markets, incentivizing farmers to scale organic production. This ensured stable prices and long-term buyer relationships. Traders interacted with farmers indirectly through the coordination of KOAN field coordinators. "Inquiries from traders includes type of value added products available, freshness and whether they are purely organic, the cost of buying the produce, quantities produced available for sale and for processing and the, location in which the produce can be found and its form in terms of processed, value added or raw, specific organic standards and use of labels and certification marks," KOAN field coordinator said.

KOAN supported in establishing new market opportunities including Kid ventures – an exhibition platform located in Kiambu County Garden Estate for farmers and processors to display their goods. Creation of a local market in Matuu town by constructing a mini kiosk to enhance retailing of the Mango juice products. Other individual shops retailing organic products linked in Nairobi includes; Sylvia's basket, Sunfresh organics, Burner market and Fine Aromas who take orders directly from YMFCS. KOAN is working to establish more markets like the Organic farmers' market at Sofia to increase consumer access. KOAN linked the cooperative to a participatory market approach system where YMFCS members interacted with buyers, input suppliers to agree on pricing of organic input for the final products. This helped in increased profitability and market expansion positioning YMFCS competitively in both local and international markets.

There is notable financial success through the mango juice product with a return on investment exceeding 100% as per the cooperative records underscoring profitability and market demand. "There is improved

livelihoods since we started working with KOAN three years ago. Members report significant income growth that has enabled better education, healthcare and food security. The cooperative's production expansion is driven by organic practices and efficient processing," said the cooperative chairman. Members are motivated to join and stay in the Co-operative due to their awareness of the health benefits of the organically produced foods and higher prices for their products. "The value addition of 1.6 kilos of fresh mango gives them a profit margin of KES 8 while mango pulp gives them KES 39. A further process into mango juice amounts to KES 378.40. This realization of where the value addition can take their business motivates farmers," he said.

Through EOAI, KOAN also supported the cooperative to purchase hand-held batch machine has significantly improved our product tracking and regulatory compliance. The key benefits included ensuring all products meet food safety and labeling regulations,

enhanced traceability to facilitate quality control and recall management. This also increased consumer confidence through strengthening trust their brand through transparent product information, ensuring the identification of genuine YMFCs products and improved batch monitoring to enabling effective inventory and shelf-life tracking.

The introduction of barcodes revolutionized the cooperative's inventory management and market access by streamlining inventory management to facilitate accurate stock tracking, enhanced traceability for quality control to strengthen monitoring of product movement and expansion into supermarkets and large retailers – Facilitating entry into formal retail markets.



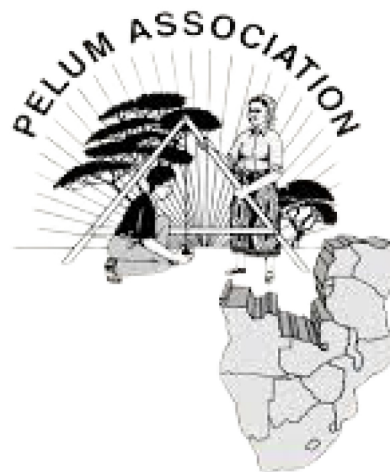


Swedish Society
for Nature Conservation



Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

**Swiss Agency for Development
and Cooperation SDC**



Networking for a greener Africa.



Participatory Ecological Land Use Management Kenya
Country Secretariat, KU Boma Estate, House Number 114
along Kenyatta Road, off Thika Superhighway exit 14



P.O. Box 6123 – 01000 Thika, Kenya



+254 709 746 939



info@pelumkenya.net